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SOURCES OF INFORMATION ON THE PROPERTIES OF METALS AND ALLOYS (BOOKS)

The National Bureau of Standards receives frequent requests for general information on the properties of metals and alloys, which are often so comprehensive in scope that reference to sources of information is the only reply practicable. This Letter Circular has been prepared for that purpose. The list of references is by no means complete. The attempt has been made to give only a working bibliography. Many references, particularly foreign ones, have been intentionally excluded from the list together with books intended for specialists' use. Articles appearing in technical periodicals have not been listed except for several series of special metallurgical lectures, symposia, and general discussions. The indexes and abstracts listed in this Letter Circular will be helpful in locating articles on special subjects in the technical literature. The National Bureau of Standards has prepared a number of information circulars dealing with individual metals and alloys. These are included in the lists of references. Those no longer available for purchase are available for consultation in technical and Government depository libraries. Information on mechanical properties of specific alloys and metals is often included in specifications for such materials.

The various sources contained herein have been arranged topically, the reference books and periodicals are generally available in any large technical or scientific library. Addresses of publishers of most of the books are listed on page 22, only the name being given after that of the book, except in the case of unusual or less common addresses, which are given together with the title of the book.

Letter Circular 522 of the National Bureau of Standards lists all the metallurgical publications which have originated in work carried out at the Bureau. A copy of that Letter Circular will be sent on request.

The Bureau of Mines, Department of the Interior, Washington, D. C. has issued a considerable number of pamphlets on the occurrence, refining, and properties of metals and other materials. A list of these publications will be sent on application to the Bureau of Mines, and copies of the papers themselves may be consulted at Government depository libraries in the larger cities.

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- O. Publishers of books listed

A. Lists of alloys

Ref.

- A 1 A dictionary of metals and their alloys. Edited by F. J. Jann.
Chem. Publ. Co., New York (1940).
- 2 Engineering alloys. N. E. Woldman and A. J. Dornblatt.
Am. Soc. Metals (1926).
- 3 A list of alloys. W. Campbell. Proc. Am. Soc. Testing Materials 22 (1)
(1930).
- 4 1001 alloy formulas. E. C. Jarvis. Niagara Falls Smelting and Refining
Co., Buffalo, N. Y. (1927).

B. Abstracts and indexes

Ref.

- B 1 Chemical Abstracts (monthly). Am. Chem. Soc., Mills Bldg., Washington, D.C.
- 2 Metals and Alloys: Current metallurgical abstracts (monthly).
Cumulative index, 1929-1931; 1932-1934; 1935; 1936; 1937; 1938; 1939.
- 3 Industrial Arts Index. H. W. Wilson Company, New York, N. Y.
- 4 Engineering Index. Am. Soc. Mech. Engrs.
- 5 Journal of Chemical Society. Gurney and Jackson, 33 Paternoster Row,
London, E. C. 4, England.
- 6 Science Abstracts. Spon and Chamberlain.
- 7 Physikalische Berichte (Journal of Physics). F. Vieweg & Sons.
- 8 Journal of Institute of Metals. Metallurgical abstracts (monthly).
London, England.
- 9 Journal, Iron and Steel Institute. Notes on progress of iron and steel
industry (semi-annual). London, England.

C. Handbooks

Ref.

- C 1 Cast Metals Handbook. Am. Foundrymen's Assn. (1940).
- 2 Manual on the cutting of metals. Am. Soc. Mech. Engrs. (1939).
- 3 Metals Handbook. Am. Soc. Metals (1939).
- 4 Handbook of Chemistry and Physics (23rd ed.). Chemical Rubber Publ.
Co. (1939).
- 5 Welding Handbook. 1st ed., American Welding Society, 29 West 39th St.,
New York, N. Y. (1938).
- 6 Kurzgefasstes Handbuch aller Legierungen (Concise Handbook of All
Alloys). E. Jänecke. Otto Spamer. Verlag, Leipzig (1937).
- 7 Iron and Steel, a pocket encyclopedia. H. P. Fiemann. 3rd ed. McGraw-
Hill Book Co. (1935).
- 8 Smithsonian Physical Tables. The Smithsonian Institution. Washington,
D. C. (1932).
- 9 Mechanical Engineers Handbook. L. S. Marks. McGraw-Hill Book Co. (1930).
- 10 Handbook of Nonferrous Metallurgy. D. M. Lippell (2 volumes). McGraw-
Hill Book Co. (1926).
- 11 International Critical Tables (II. Metallurgical data). National
Research Council. McGraw-Hill Book Co. (1926-28).
- 12 Mechanical Engineers Handbook. R. P. Kent. J. Wiley & Sons (1923).

C. Handbooks (continued)

- C 13 Physikalische-Chemische Tabellen (Physical-chemistry tables).
Landolt-Bornstein-Roth. J. Springer (1927).
- 14 The Goldsmith's Handbook; containing full instructions for the alloying and working of gold. G. E. Gee. Crosby Lockwood & Sons (1922).
- 15 Scientific American Cyclopedia of Formulas. A. E. Hopkins. Sci. Am. Publ. Co., New York (1921).
- 16 Chronology of Iron and Steel. S. L. Goodale. Pittsburgh Iron and Steel Foundries Co. (1920).
- 17 The Founder's Manual. David W. Payne. D. VanNostrand Co. (1920).
- 18 Henley's Twentieth Century Book of Recipes, Formulas and Processes. N. Henley (1919).
- 19 Metal Worker's Handy Book of Receipts and Processes. W. T. Brannt. H. C. Baird & Co. (1919).
- 20 Metallurgical Calculations. J. W. Richards. McGraw-Hill Book Co. (1918).

D. Statistics

Ref.

- D 1 Standard metal directory. 8th ed. Atlas Publ. Co., New York (1940).
- 2 Yearbook of the American Bureau of Metal Statistics, 35 Rector St., New York, N. Y. 19th annual issue (1939).
- 3 Metal statistics. 32nd annual edition. Am. Metal Market Co., 11 Cliff St., New York (1939).
- 4 Directory iron and steel works of the United States and Canada. Am. Iron and Steel Inst. (1935).
- 5 Mineral industry. McGraw-Hill Book Co. (annual).
- 6 Annual statistical report of the American Iron and Steel Institute. Am. Iron and Steel Inst.

E. Nonferrous metals and alloys (general)

Ref.

- E 1 Refining precious metal wastes. C. M. Hoke. Metallurgical Publ. Co., New York (1940).
- 2 Aluminum bronze. Publ. No. 31, Copper Development Assn., London (1939).
- 3 Elastic properties of nonferrous metals and alloys. Collected data. J. McKeown and E. D. Ward. Brit. Non-Fer. Metals Res. Assn., London (1938).
- 4 Manganese. A. W. Groves. Imperial Institute, London (1938).
- 5 Die Korrosion von nichteisenmetallen und deren Legierungen (The corrosion of nonferrous metals and their alloys). O. Kröhnke and G. Masing. Bd. II. S. Hirzel, Leipzig (1938).
- 6 Bearing metals and alloys. H. W. Bassett. Edw. Arnold & Co., London (1937).
- 7 Modern uses of nonferrous metals. Edited by C. H. Mathewson. Am. Inst. Min. Met. Engrs. (1935).
- 8 Precious metals. E. A. Smith. N.A.G. Press, London (1934).
- 9 The casting of brass ingots. R. Genders and G. L. Bailey. Brit. Non-ferrous Metals Res. Assn., Euston St., London, N.W. 1. (1934).
- 10 The materials of aircraft construction. F. F. Hill. Sir I. Pitman & Sons (1932).

E. Nonferrous metals and alloys (general) (continued)

Ref.

- E 11 Bearing metals and bearings. W. E. Corse. Reinhold Publ. Co. (1930).
12 Impurities in metals. J. J. Smithells. 2nd ed. J. Wiley & Sons (1930).
13 Metallurgy of white metal scrap. E. R. Phews. D. VanNostrand (1950).
14 The metallurgy of bronze. H. J. Dews. Sir I. Pitman & Sons (1930).
15 Pin solders. A modern study of the properties of tin solders and soldered joints. J. S. Nightingale. Brit. Nonferrous Metals Res. Assn. (1929).
16 Alloys and their industrial applications. E. F. Law. 4th ed. C. Griffin & Co., London (1926).
17 Metallic alloys. G. H. Gulliver. 5th ed. C. Griffin & Co. (1926).
18 Science of metals. Z. Jeffries and E. S. Archer. McGraw-Hill Book Co. (1924).
19 Aeronautics, metallurgy, general index. F. Glazebrook. Macmillan & Co. Ltd., London (1923).
20 Chemistry of the rare metals. B. F. Hopkins. D. C. Heath & Co., Boston (1925).
21 Engineering nonferrous metals and alloys. L. Aitchison and W. R. Barclay. H. Frowde & Hodders & Stoughton, London (1928).
22 Metals and metallic compounds. U. R. Evans. 4 vols. E. Arnold & Co. London (1923).
23 Metals and their alloys. J. Vickers. H. C. Baird & Co. (1923).
24 A comprehensive treatise on inorganic and theoretical chemistry. J. W. Mellor. 16 vols. Longmans, Green & Co. (1922-58).
25 Gold alloys, their manufacture and application. G. E. Gee. Crosby Lockwood & Son, London (1922).
26 Metallography. 2. Metals and their common alloys. S. Hoyt. McGraw-Hill Book Co. (1921).
27 Brazing and soldering. J. F. Hobart. D. VanNostrand (1919).
Also references: Nf2, 5, 5, 6, 7, 9.

F. Iron and Steel

Ref.

- F 1 Alloys of iron and chromium. Vol. II - High chromium alloys. A. B. Kinzel and R. Franks. McGraw-Hill Book Co. (1940).
2 Function of alloying elements in steel. E. C. Bain. Am. Soc. Metals (1939).
3 Modern steels. Edited by E. E. Thum. Am. Soc. Metals (1939).
4 Alloys of iron and nickel. J. S. Marsh. McGraw-Hill Book Co. (1938).
5 Forging practice. C. G. Johnson. Am. Tech. Soc., Chicago, Ill. (1936).
6 Steels for the user. R. F. Rolfe. Onam. Publ. Co., New York (1938).
7 Working and heat-treating of steel. R. H. Harcourt. Stanford University, Calif. (1938).
8 Structure of steel. E. W. Simons and E. Gregory. Prentice-Hall, New York (1938).
9 Steel and its heat treatment. B. R. Bullens. J. Wiley & Sons. Vol. I, 4th ed. (1938); Vol. II (1939).
10 Sampling and analysis of carbon and alloy steels, Chemists' Committee of U. S. Steel Corp., Reinhold Publ. Co. (1938).
11 Elements of ferrous metallurgy. J. L. Rosenholts and J. F. Oesterle. 2nd ed. J. Wiley & Sons (1938).

F. Iron and Steel (continued)

Ref.

- F 12 Molybdenum in steel. Climax Molybdenum Corp., 500 Fifth Avenue, New York, N. Y. (1938).
- 13 Nickel alloy steels, compilation of data sheets. The International Nickel Company, 67 Wall Street, New York (1938).
- 14 Alloys of iron and chromium: Vol. 1 - Low chromium alloys. A. B. Kinzel and W. Crafts. McGraw-Hill Book Co. (1937).
- 15 The outline of steel and iron. A. Allison. The Sherwood Press, Cleveland, Ohio (1937).
- 16 Tool steel simplified. F. R. Palmer. Carpenter Steel Co., Reading, Pa. (1937).
- 17 Vanadium steels and irons. Vanadium Corporation of America, 420 Lexington Ave., New York (1937).
- 18 Production, heat treatment, and properties of iron alloys. L. Jordan. Circular, National Bureau of Standards C409. Superintendent of Documents (1936). 15 cents.
- 19 Steel physical properties atlas. Am. Soc. Metals (1936).
- 20 Technical iron and steel. P. Obernoffer (revised by W. Eilender and H. Esser). J. Springer (1936).
- 21 The alloys of iron and carbon. I. Constitution. S. Epstein. II. Properties. F. T. Sisco. McGraw-Hill Book Co. (1936).
- 22 Bibliography on non-metallic inclusions in iron and steel. L.F. McCombs and M. Scherrer. Carnegie Institute of Technology. (1935).
- 23 Book of stainless steels. E. E. Thum. 2nd ed. Am. Soc. Metals (1935).
- 24 Chromium steels. R. H. Greaves. His Majesty's Stationery Office, London (1935).
- 25 Constitution of steel and cast iron. F. T. Sisco. Am. Soc. Metals (1935).
- 26 Inclusions in iron. C. Wohrman. Am. Soc. Metals (1935).
- 27 Lectures on steel and its treatment. J. F. Keller. Am. Soc. Metals (1935).
- 28 Metallography and heat treatment of iron and steel. A. Sauveur. 4th ed. Cambridge Mass. University Press (1935).
- 29 Principles of phase diagrams. J. S. Marsh. McGraw-Hill Book Co. (1935).
- 30 Sonderstahlkunde (Special steels). E. Houdremont. J. Springer (1935).
- 31 Steel treating practice. R. H. Sherry. McGraw-Hill Book Co. (1935).
- 32 The metal - iron. H. E. Cleaves and J. G. Thompson. McGraw-Hill Book Co. (1935).
- 33 The quenching of steels. H. J. French. Am. Soc. Metals (1935).
- 34 Tool steels. J. P. Gill. Am. Soc. Metals (1935).
- 35 Working, heat-treating and welding of steel. H. L. Campbell. J. Wiley & Sons (1935).
- 36 Metallurgy of iron and steel. E. Stoughton, McGraw-Hill Book Co. (1934).
- 37 The alloys of iron and copper. J. L. Gregg and B. N. Daniloff. McGraw-Hill Book Co. (1934).
- 38 The alloys of iron and tungsten. J. L. Gregg. McGraw-Hill Book Co. (1934).
- 39 The alloys of iron and silicon. E. S. Greiner, J. S. Marsh and Bradley Stoughton. McGraw-Hill Book Co. (1933).
- 40 The alloys of iron and molybdenum. J. L. Gregg. McGraw-Hill Book Co. (1932).

F. Iron and Steel (continued)

Ref.

- F 41 The physical chemistry of steel-making, the solubility of iron oxide in iron. C. H. Herty. Carnegie Inst. of Technology (1932).
- 42 Chemical analysis of iron and steel. G.E.F. Lundell, J. I. Hoffman and H. A. Bright. J. Wiley & Sons (1931).
- 43 High-speed steel. M. A. Grossman and E. C. Bain. J. Wiley & Sons (1931).
- 44 Non-metallic inclusions in iron and steel. Carl Benedicks and H. Lofquist. J. Wiley & Sons (1931).
- 45 Stainless iron and steel. J. H. G. Monypenny. 2nd ed. McGraw-Hill Book Co. (1931).
- 46 Sheet steel and tin plate. A. W. Shannon. Reinhold Publ. Co. (1930).
- 47 Photomicrographs of iron and steel. E. H. Reed. J. Wiley & Sons (1929).
- 48 An introduction to the metallurgy of iron and steel. H. H. Eoylston. J. Wiley & Sons (1928).
- 49 Automobile steels. A. Lueller-Hauff and K. Stein. (translation). J. Wiley & Sons (1927).
- 50 Non-technical chats on iron and steel. L. W. Spring. F. A. Stokes Co., New York (1927).
- 51 Principles of metallurgy. An introduction to the metallurgy of Metals. J. H. Fulton. Am. Soc. Metals (1927).
- 52 Das technische Eisen, Konstitution und Eigenschaften (Technical iron, constitution and properties). P. Oberhoffer. J. Springer (1925).
- 53 Metallurgy in aircraft construction. S. Daniels and F. P. Sisco. Air Service, Dayton, Ohio (1925).
- 54 Molybdenum, cerium and related alloy steels. H. K. Gillett and E. L. Mack. Reinhold Publ. Co. (1925).
- 55 The making, shaping and treating of steel. J. Camp and J. B. Francis. 4th ed. Carnegie Steel Co., Pittsburgh (1925).
- 56 The manufacture of electric steel. F. P. Sisco. McGraw-Hill book Co. (1924).
- 57 Invar and related nickel steels. Circular, National Bureau of Standards 358. Superintendent of Documents (1923). 30 cents.
- 58 Metallurgy of steel. F. W. Harbord and J. W. Hill. J. E. Lippincott Co. (1923).
- 59 Aircraft steels and materials. L. Aitchison. Constable & Co., London (1922).
- 60 Engineering steels. L. Aitchison. L. VanNostrand (1921).
- 61 Heat treatment of soft and medium steels. L. Giolitti. McGraw-Hill Book Co. (1921).

Also references. C7, C16, Nbl-17, Ndl-14, Ng14.

The names of steel manufacturers and the type of product they manufacture are listed in the Iron and Steel Works Directory of the United States and Canada, American Iron and Steel Institute, 150 Fifth Avenue, New York, N. Y. Useful pamphlets describing their products have been issued by many companies. The following are typical:-

- 1 Allegheny-Ludlum Steel Company, Brackenridge, Pa.
- 2 American Rolling Mill Company, Middletown, Ohio
- 3 Bethlehem Steel Company, Bethlehem, Pennsylvania
- 4 Carnegie-Illinois Steel Company, Pittsburgh, Pa.
- 5 Climax Molybdenum Company, 500 Fifth Avenue, New York, N. Y.
- 6 Crucible Steel Company of America, 17 East 42nd Street, New York, N.Y.
- 7 Cyclops Steel Company, Titusville, Pennsylvania
- 8 Donner Steel Company, Buffalo, New York
- 9 Firth-Sterling Steel Company, McKeesport, Pa.
- 10 Inland Steel Company, 38 So. Dearborn Street, Chicago, Ill.
- 11 Interstate Iron and Steel Company, 104 So. Michigan Ave., Chicago, Ill.
- 12 Latrobe Electric Steel Company, Latrobe, Pennsylvania
- 13 Republic Steel Corporation, Cleveland, Ohio
- 14 Simonds Saw and Steel Company, Lockport, New York
- 15 Tacony Steel Company, Tacony, Philadelphia, Pa.
- 16 The Carpenter Steel Company, Reading, Pennsylvania
- 17 The International Nickel Company, 67 Wall Street, New York, N. Y.
- 18 The Midvale Company, Nicetown, Philadelphia, Pennsylvania
- 19 Finken Steel and Tube Company, Canton, Ohio
- 20 Titanium Alloys Manufacturing Company, Niagara Falls, New York
- 21 Universal Steel Company, Bridgeville, Pennsylvania
- 22 Vanadium Alloys Steel Company, Latrobe, Pennsylvania
- 23 Vanadium Corporation of America, 420 Lexington Avenue, New York, N.Y.

G. Foundry, cast iron and nonferrous metals

Ref.

- G 1 Cast metals handbook. Am. Foundrymen's Assn. (1940).
- 2 Steel casting design for the engineer and foundryman. C. W. Briggs, R. A. Gezelius and A. R. Danielson. Am. Foundrymen's Assn. (1939).
- 3 Foundry work. W. C. Stimpson and B. L. Gray. Revised by J. Grennan. Am. Tech. Soc., Chicago (1939).
- 4 Metal spraying. 2nd ed. Revised and largely rewritten by E. C. Rollason. (T. H. Turner and N. F. Budgen, original authors). J. E. Lippincott Co. (1939).
- 5 Alloy cast irons. Am. Foundrymen's Assn. (1939).
- 6 A manual of foundry practice. 2nd ed. J. Laing and R. F. Rolfe. The Sherwood Press (1939).
- 7 Blast furnace practice. R. H. Sweetser. McGraw-Hill Book Co. (1938).
- 8 Recommended practice for sand cast high lead bronzes. Committee Report. Am. Foundrymen's Assn. (1938).
- 9 Testing and grading foundry sands and clays. Committee on Molding Sand Research. Am. foundrymen's Assn. 4th ed. (1938).
- 10 Copper in cast steel and iron. Copper Development Assn., Millbank, London, England (1937).
- 11 Molybdenum in cast iron. Climax molybdenum Corporation (1937).
- 12 Elementary foundry technology. L. A. Hartley. 2nd ed. The Penton Publ. Co. (1937).
- 13 The influence of design on the stress resistance of steel castings. R. A. Bull. Am. Foundrymen's Assn. (1937).

G. Foundry, cast iron and nonferrous Metals (continued)

Ref.

- G 14 Gray cast iron. J. W. Bolton. The Penton Publ. Co. (1937).
 - 15 Metal casting. H. L. Campbell. J. Wiley & Sons (1936).
 - 16 Die castings. H. L. Chase. J. Wiley & Sons (1935).
 - 17 Gates and risers for castings. P. Dwyer. The Penton Publ. Co. (1935).
 - 18 Steel foundry. J. H. Hall. McGraw-Hill Book Co. (1935).
 - 19 Present status of foundry sand investigation and control. W.G.Reichert.
Am. Foundrymen's Assn. (1935).
 - 20 Electric melting practice. A. G. Robiette. J. E. Lippincott Co. (1934).
 - 21 Symposium on cast iron prepared by Am. Foundrymen's Assn. and Am. Soc.
Testing Materials (1933).
 - 22 Effect of elevated temperatures on certain mechanical properties of
gray cast iron and malleable iron. Symposium on Effect of Temper-
atures on the Properties of Metals. J. W. Bolton and H. Bornstein.
Am. Soc. Testing Materials and Am. Soc. Mech. Engrs. (1931).
 - 23 Die castings. Marc Stern. McGraw-Hill Book Co. (1930).
 - 24 The principles of iron founding. R. Moldenke. 2nd ed. McGraw-Hill
Book Co. (1930).
 - 25 Melting iron in the cupola. J. E. Hurst. The Penton Publ. Co. (1929).
 - 26 Cast iron in the light of recent research. W. H. Hatfield. 3rd ed.
C. Griffin & Co. (1928).
 - 27 Foundry sand, its uses and abuses. E. W. Smith. For sale by the author,
Chicago, Ill. (1926).
 - 28 Industrial furnaces. W. Trinks. 2 vols. J. Wiley & Sons (1925).
 - 29 American malleable cast iron. H. A. Schwartz. The Penton Publ.Co.(1922).
 - 30 Practical iron founding. F. G. Korner. Sir I. Pitman & Sons (1920).
- Also references: Cl, Cl7, E9, E14, F36, F48, Nb17, Nd13, Nell, Nf14, Ng5,
Ng6, Ng7, N1-1, N1-2.

H. Individual metals

Ha - Aluminum

Ref.

- Ha1 Metallography of aluminum and its alloys. V. Fuss. Trans. R.J.Anderson.
The Sherwood Press (1939).
- 2 The technology of aluminum and its light alloys. Alfred vonZeerleder.
Trans. A. J. Field. 3rd ed. Gustav Fock, 145 W. 44th St., New York,
N. Y. (1938).
- 3 Aluminum and its alloys. N. F. Budgen. Sir I. Pitman & Sons (1933).
- 4 Service characteristics of light metals and alloys. Committee B-7.
Am. Soc. Testing Materials (1932).
- 5 Secondary aluminum. R. J. Anderson. The Sherwood Press (1931).
- 6 The aluminum industry. 2 vols. J. D. Edwards, F. C. Frary and
Z. Jeffries. McGraw-Hill Book Co. (1930).
- 7 Light metals and alloys. Circular, National Bureau of Standards C546.
Superintendent of Documents (1927). \$1.10.
- 8 Working of aluminum. E. F. Painton. Chapman & Hall (1927).
- 9 Aluminum, the metal and its alloys. M. G. Corson. D. VanNostrand (1926).

Ha - Aluminum (continued)

Ref.

Ha10 Metallurgy of aluminum and aluminum alloys. R. J. Anderson.

H. C. Baird & Co. (1925).

11 Aluminum in aircraft. Aluminum Company of America, Pittsburgh, Pa.

Also references: C3, E7, E22, E24, Nc5, Nf8, Nf16.

The Aluminum Company of America, Gulf Building, Pittsburgh, Pa. has prepared technical pamphlets which discuss aluminum, its alloys and their industrial uses which are usually sent on request.

Hb - Antimony

Ref.

Hb1 Antimony. C. Y. Wang. 2nd ed. C. Griffin & Co. (1926).

Also references: E7, E24.

Hc - Arsenic

Ref.

Hc1 Handbook of nonferrous metallurgy. Chapter XII of Volume 2. Arsenic.

W. C. Smith. McGraw-Hill Book Co. (1926).

Also references: E7, E24.

Hd - Beryllium

Ref.

Hd1 Beryllium, its production and application. Trans. R. Rimbach and

A. J. Michel. Reinhold Publ. Co. (1932).

Also references: E7, E24, Ha7.

He - Bismuth

Ref.

He1 Bismuth. J. G. Thompson. Circular, National Bureau of Standards C382.

Superintendent of Documents (1930). 10 cents.

Also references: E7, E24.

Hf - Cadmium

Ref.

Hf1 Cadmium, its metallurgy, properties and uses. N. F. Budgen.

C. Griffin & Co. (1924).

Also references: C3, E7, E24.

Hg - Calcium, barium, lithium, etc.

See references: C3, E7, E24.

Hh - Chromium

See references: E7, E24.

Hi - Cobalt

Ref.

Hi1 Cobalt, nickel and the elements of the platinum group. Vol. IX.

J. A. N. Friend. C. Griffin & Co. (1922).

Also references: E7, E24.

Hj - Copper

Ref.

- Hj1 Brass pipe handbook, Copper and Brass Research Association (1940).
- 2 Copper pipe-line services in building. Copper Development Assn., London (1938).
- 3 Commercially important copper alloys. Chase Copper and Brass Co., Waterbury, Conn. (1936).
- 4 Arsenical and argentiferous copper. J. L. Gregg. Reinhold Publ.Co.(1934).
- 5 Metallurgy of copper. H. O. Hoiman (revised by C. R. Hayward). 2nd ed. Mining & Metallurgy, 29 West 30th Street, New York (1934).
- 6 The story of copper. W. Davis. The Century Company, 352 Fourth Ave., New York, N.Y. (1924).

Also references: C3, E2, E7, E24, E27, H15.

Pamphlets relating to the various industrial uses of copper are available from the following:- The Copper and Brass Research Association, 420 Lexington Avenue, New York, N. Y., and Copper Development Association, London, England.

Hk - Gold

Ref.

- Hk1 The metallurgy of gold. F. K. Rose and W. A. C. Newman. 7th ed. J. L. Lipincott Co. (1937).
- 2 Working in precious metals. E. A. Smith. 2nd ed. N.A.G. Press, Ltd., London (1937).
- 3 Gold alloys. G. E. Gee. J. Lockwood & Son, London (1929).

Also references: C3, E7, E8, E24, E25.

Hi - Lead

Ref.

- Hi1 Useful information about lead. Lead Industries Assn., 420 Lexington Ave., New York (1931).
- 2 Lead, the precious metal. O. C. Harn. The Century Co. (1924).
- 3 Lead, its occurrence in nature, the modes of its extraction, its properties and uses. J. A. Smythe. Longmans, Green & Co. (1923).

Also references: C3, E7, E24.

Lead Industries Association also issues "Lead", a quarterly publication, and some other technical pamphlets.

Hm - Magnesium

Ref.

- Hm1 Magnesium. American Magnesium Corporation, Cleveland, Ohio (1932).

Also references: C3, E7, E24, H47.

The Dow Chemical Company, Midland, Michigan has issued several pamphlets on the subject. Two outstanding ones are "Downmetal" and "Downmetal Laboratory Methods".

Hn - Manganese

Ref.

- Hn1 Manganese, its uses, preparation, mining costs and production of ferro-alloys. J. M. Weld and others. Bureau of Mines Bul. 173. Superintendent of Documents (1920).

Also references: E4, E7.

Hg - Mercury

Ref.

Hg1 Metallurgy of quicksilver. L. H. Duschek and J. N. Schuette.
Bureau of Mines Bul. 222. Superintendent of Documents (1925).

Also references: E7, E24.

Hp - Molybdenum

Ref.

Hp1 Molybdenum in steel. Climax Molybdenum Corporation (1938).
2 Molybdenum in cast iron. Climax Molybdenum Corporation (1937).
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2 American Institute of Mining and Metallurgical Engineers, 29 West 39th
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3 American Iron and Steel Institute, 350 Fifth Avenue, New York, N.Y.
4 American Society of Mechanical Engineers, 29 West 39th Street, New
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| 6 | American Society for Testing Materials, 260 South Broad Street, Philadelphia, Pa. |
| 7 | Baird, H. J., and Co., 2 West 45th Street, New York, N. Y. |
| 8 | Chemical Rubber Publishing Company, Cleveland, Ohio. |
| 9 | Hartleben, A., Vienna and Leipzig, Germany. |
| 10 | Henley, Norman, Publishing Company, 2 West 45th Street, New York, N.Y. |
| 11 | Industrial Press, 140 South Lafayette Street, New York, N. Y. |
| 12 | Law Printing Company, 22 Fulton Street, New York, N. Y. |
| 13 | Lippincott, J. E. Company, 227 South Sixth Street, Philadelphia, Pa. |
| 14 | Longmans, Green & Co., 114 Fifth Avenue, New York, N. Y. |
| 15 | MacMillan & Company, 60 Fifth Avenue, New York, N. Y. |
| 16 | McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York, N. Y. |
| 17 | Metals and Alloys, 330 West 42nd Street, New York, N. Y. |
| 18 | Penton Publishing Company, The, Penton Building, Cleveland, Ohio. |
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| 22 | Springer, J., 23-4 Lunkstrasse, Berlin W. 9, Germany. |
| 23 | Superintendent of Documents, Government Printing Office, Washington, D.C. |
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